

Headquarters Air Combat Command

Effects-Based Operations

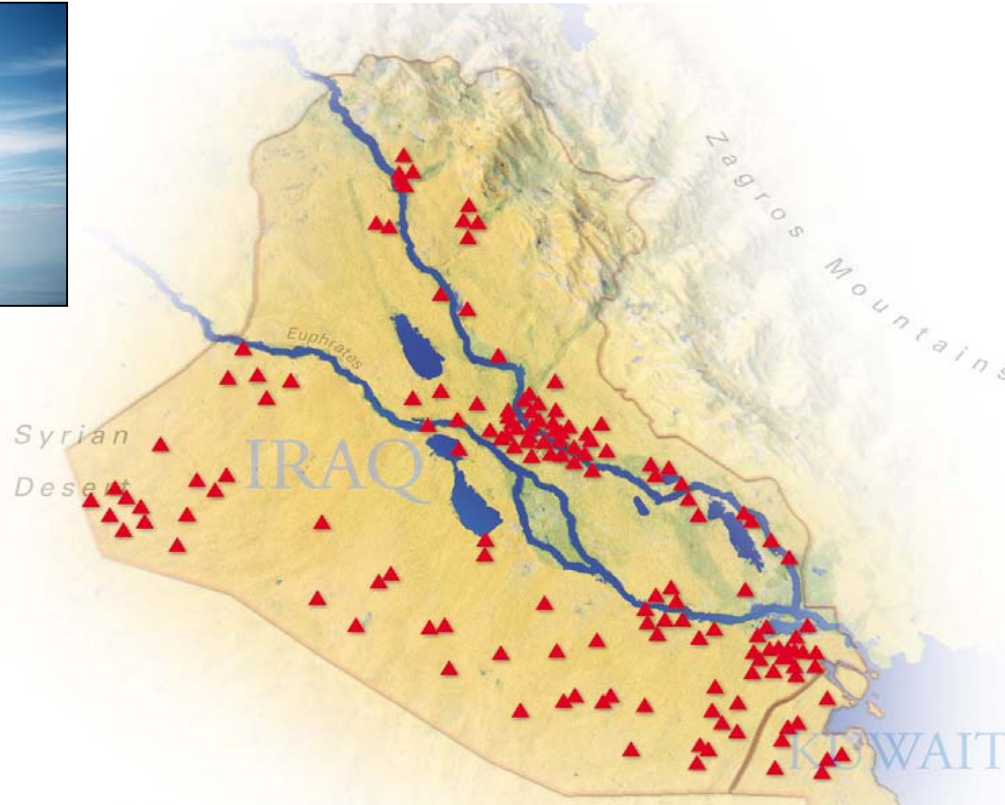


This Briefing
is Classified:
UNCLASSIFIED

Col Gary Crowder
Chief, Strategy, Concepts
and Doctrine
Air Combat Command



Desert Storm



Over 150 target attacks planned in 24 hours... more than in the years 1942 and 1943 combined over central Europe in WWII



How Was This Possible?

The maturation of airpower technologies merged with a theory of targeting for systemic effect rather than absolute destruction

**Advanced Technologies (Stealth + Precision)
+
New Planning Approach (Effects Based Planning)
=
New Concept of Operations (Parallel War)**

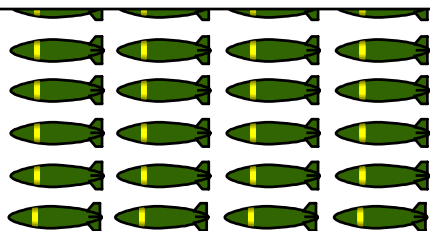
Defining Event Of Revolution in Military Affairs (RMA)



Precision Redefines the Concept of Mass



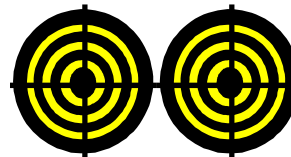
1500 B-17 sorties
9000 bombs (250#)
3300 ft CEP
One 60' x 100' target
WWII



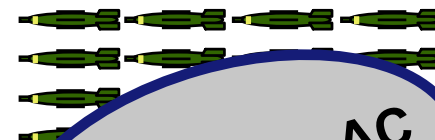
30 F-4 sorties
176 bombs (500#)
400 ft CEP
One Target
Vietnam



1 F-117 sortie
2 bombs (2000#)
10 ft CEP
Two Targets per Sortie
Desert Storm



1 B-2 sortie
16 bombs (2000#)
20 ft CEP
16 Targets per Pass
Available Now

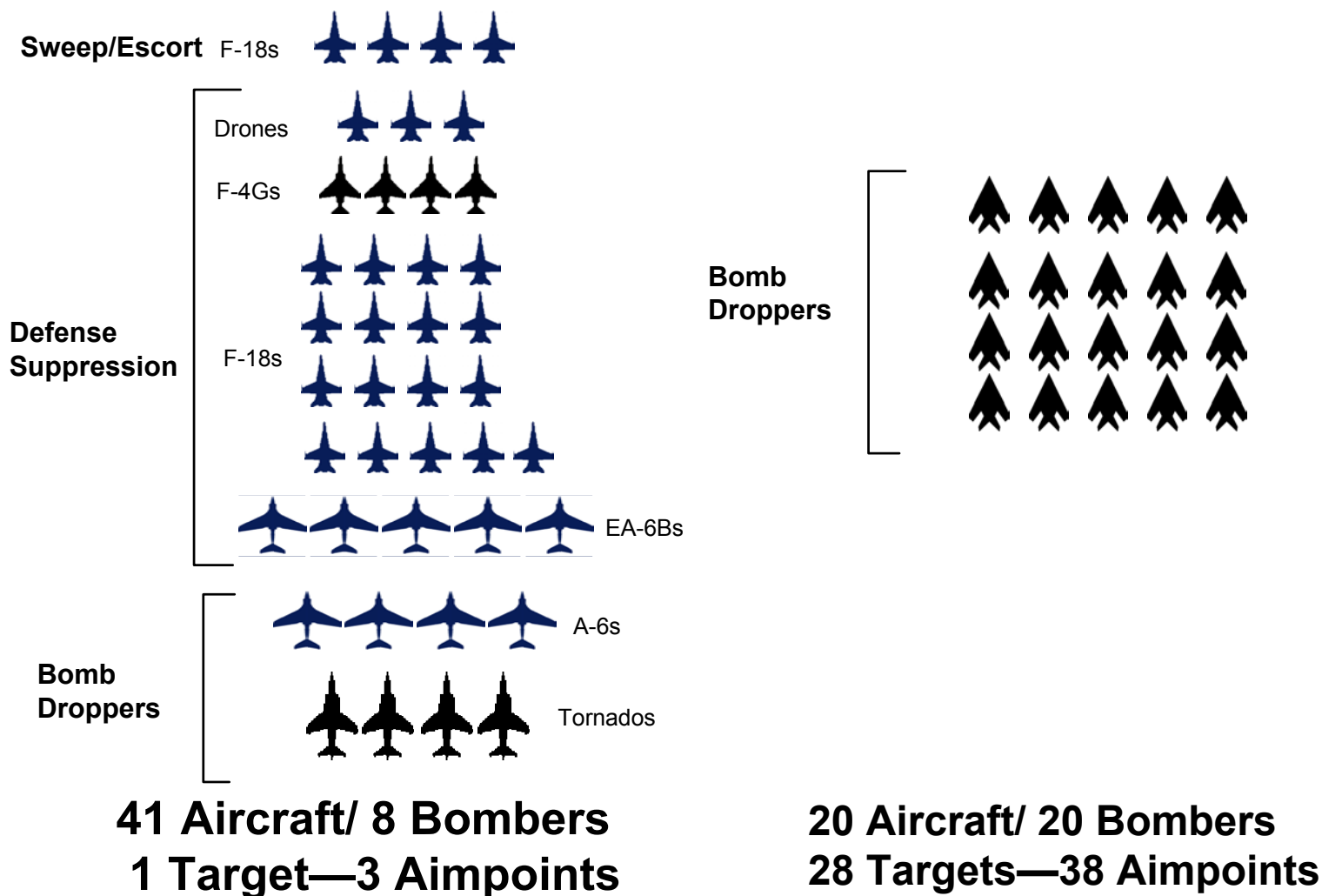


**All WX, One AC
Many Targets**

Over five decades, advanced platforms and precision munitions revolutionized the effects of airpower by shortening the time and sorties required to strike a target (or targets!).

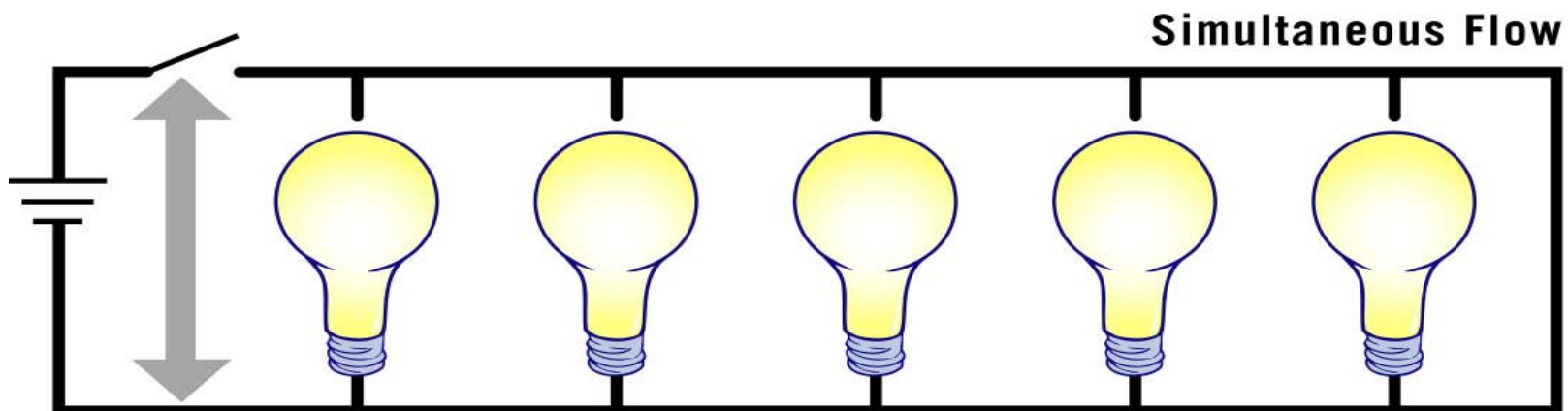
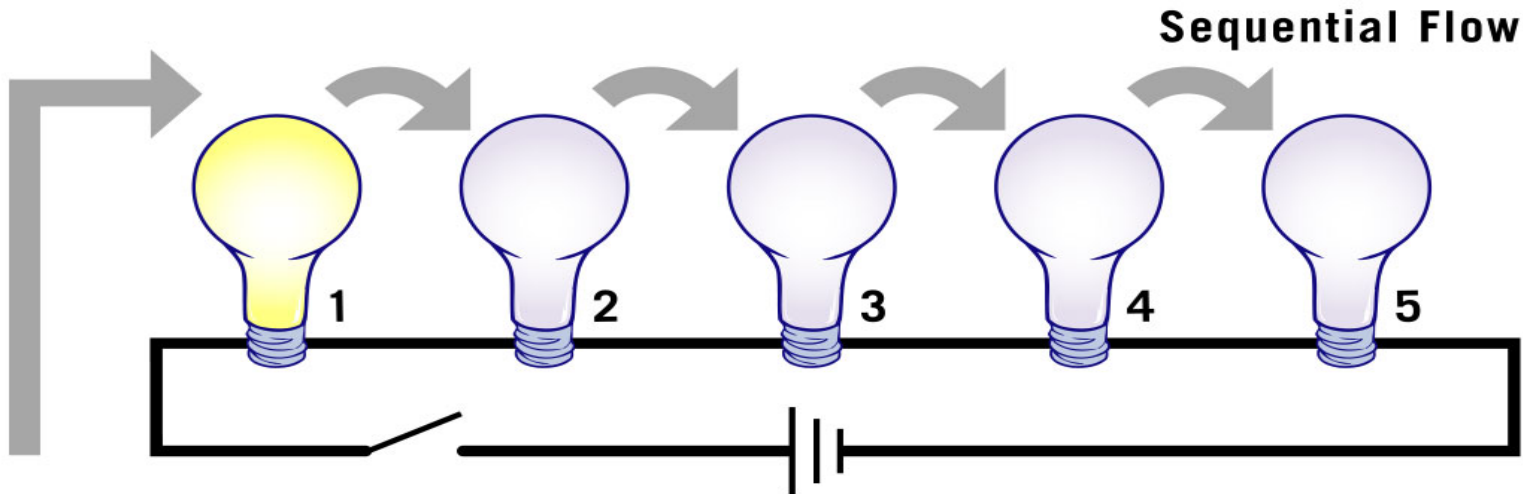


The Leverage of Stealth: Non-Stealth vs Stealth Attack



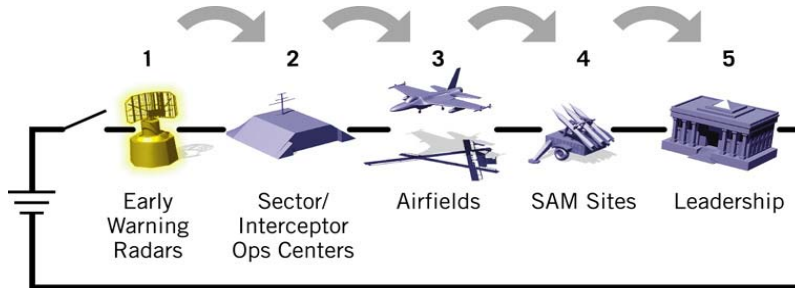


Sequential vs Simultaneous Operations

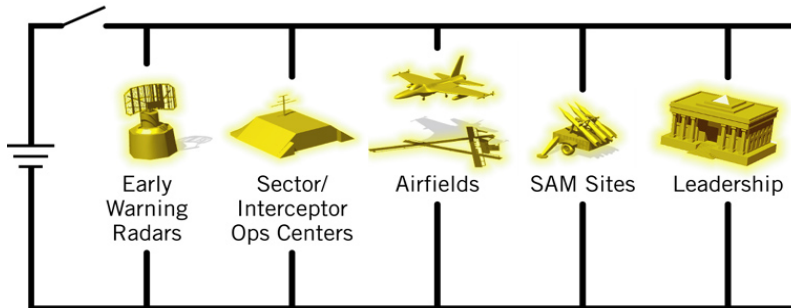




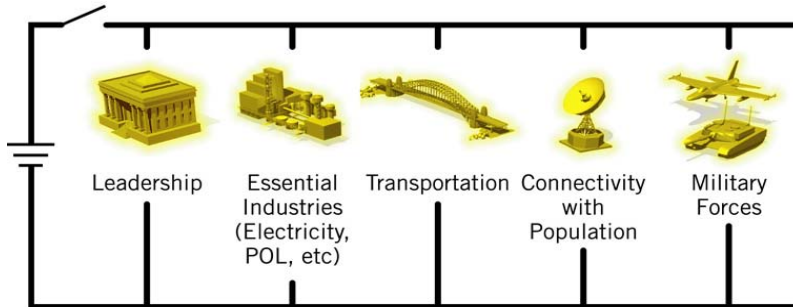
Parallel Warfare and Simultaneous Attack



Series Warfare – Sequential Attack



Parallel Warfare – Simultaneous Attack (Weighted Against Air Defense)



Parallel Warfare – Simultaneous Attack Against All Vital Enemy Systems

SERIES WARFARE - SEQUENTIAL ATTACK

Series attack of each target element in a Target System

PARALLEL WARFARE - SEQUENTIAL ATTACK

Parallel attack of each target element in a Target System

PARALLEL WARFARE - SIMULTANEOUS ATTACK

Parallel attack of each Target System

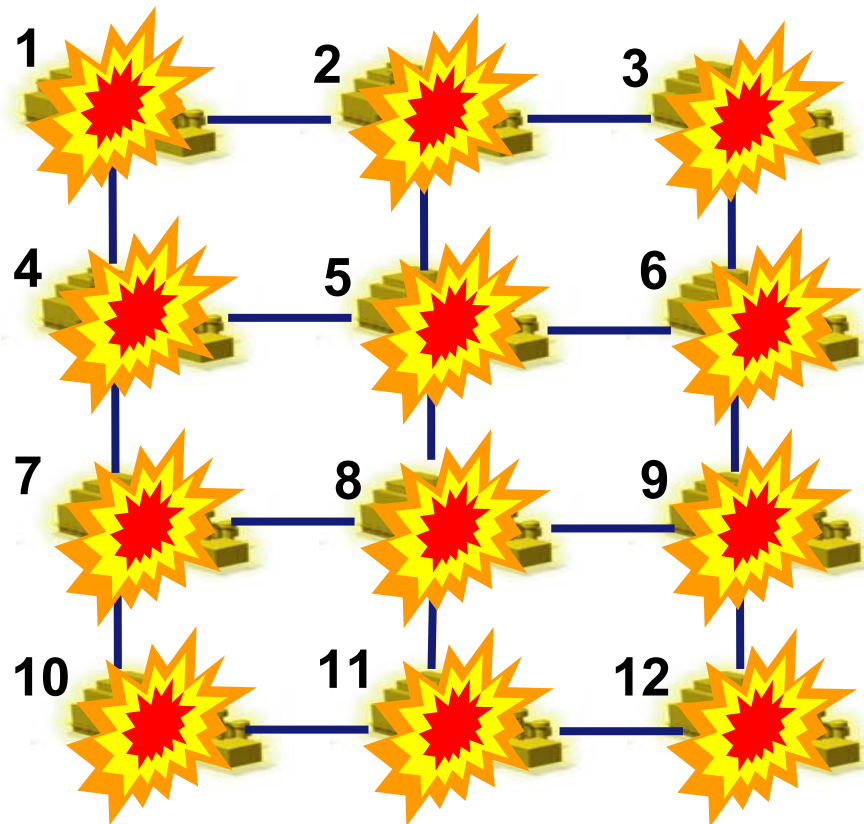


Attrition vs Effects-based Operations



Essential Industries
(Electricity, POL, etc)

<u>Priority</u>	<u>Target</u>
1.	Plant 1
2.	Plant 2
3.	Plant 3
4.	Plant 4
5.	Plant 5
6.	Plant 6
7.	Plant 7
8.	Plant 8
9.	Plant 9
10.	Plant 10
11.	Plant 11
12.	Plant 12



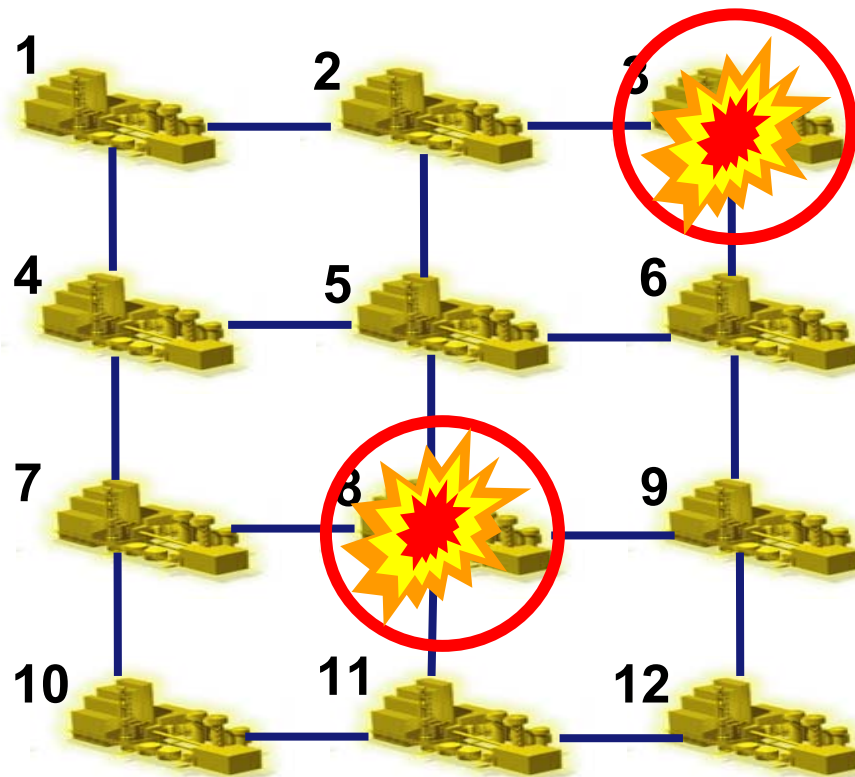


Attrition vs Effects-based Operations



Essential Industries
(Electricity, POL, etc)

<u>Priority</u>	<u>Target</u>
1.	Plant 3
<u>2.</u>	<u>Plant 8</u>
3.	Plant 9
4.	Plant 10
5.	Plant 1
6.	Plant 4
7.	Plant 2
8.	Plant 6
9.	Plant 5
10.	Plant 11
11.	Plant 12
12.	Plant 7



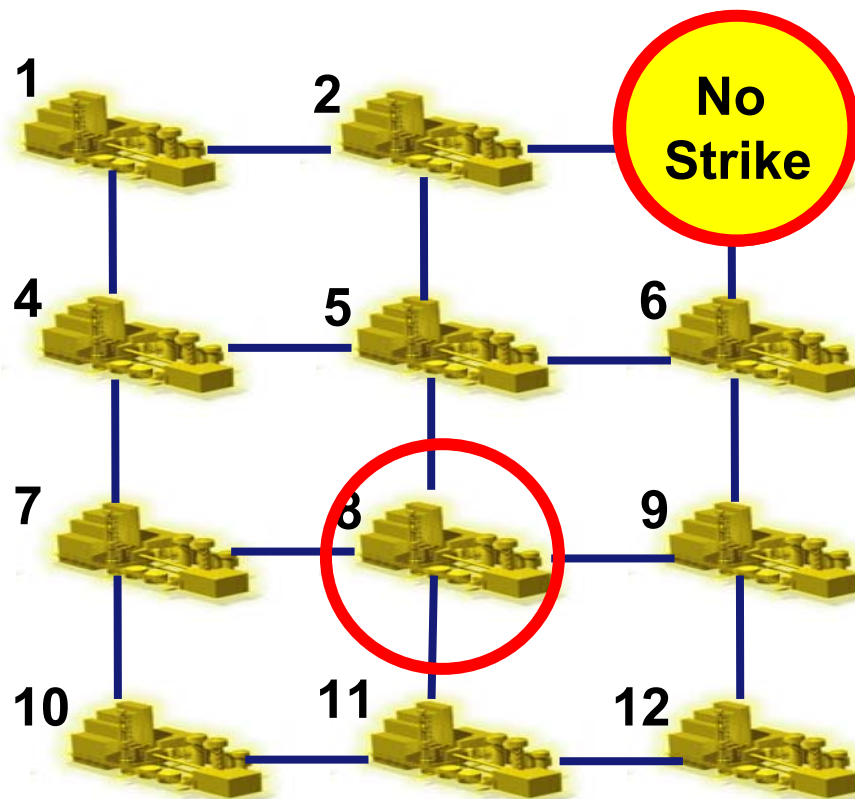


Attrition vs Effects-based Operations



Essential Industries
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<u>Priority</u>	<u>Target</u>
1.	Plant 3
<u>2.</u>	<u>Plant 8</u>
3.	Plant 9
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Attrition vs Effects-based Operations



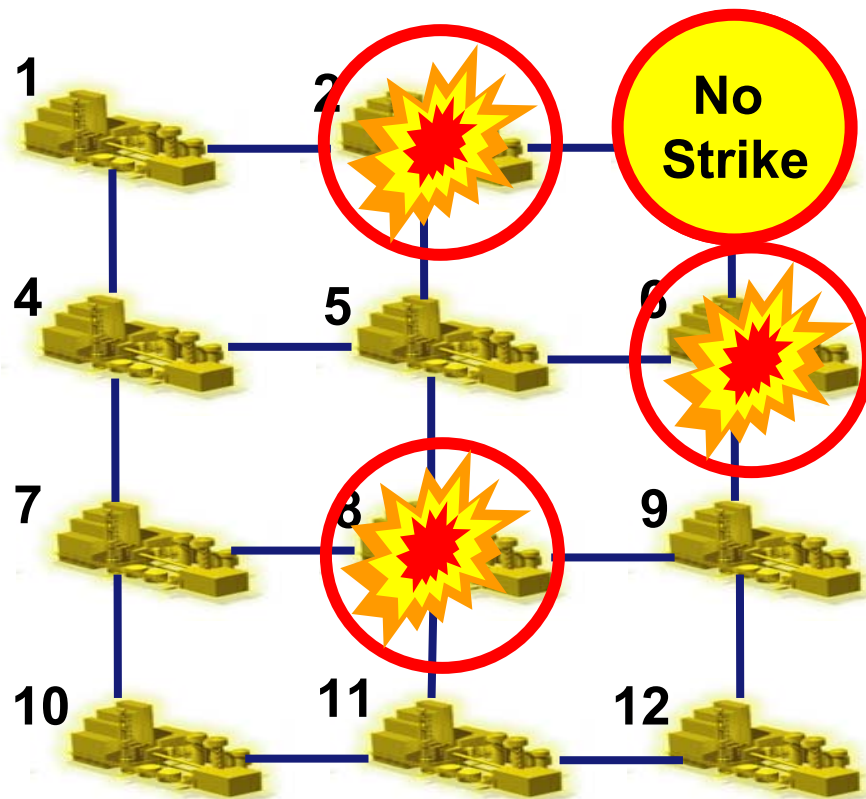
Essential Industries
(Electricity, POL, etc)

Priority

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.
- 12.

Target

- Plant 8
- Plant 2
- Plant 6
- Plant 9
- Plant 10
- Plant 1
- Plant 4
- Plant 5
- Plant 11
- Plant 12
- Plant 7
- Plant 3 (No Strike)





Attrition vs Effects-based Operations

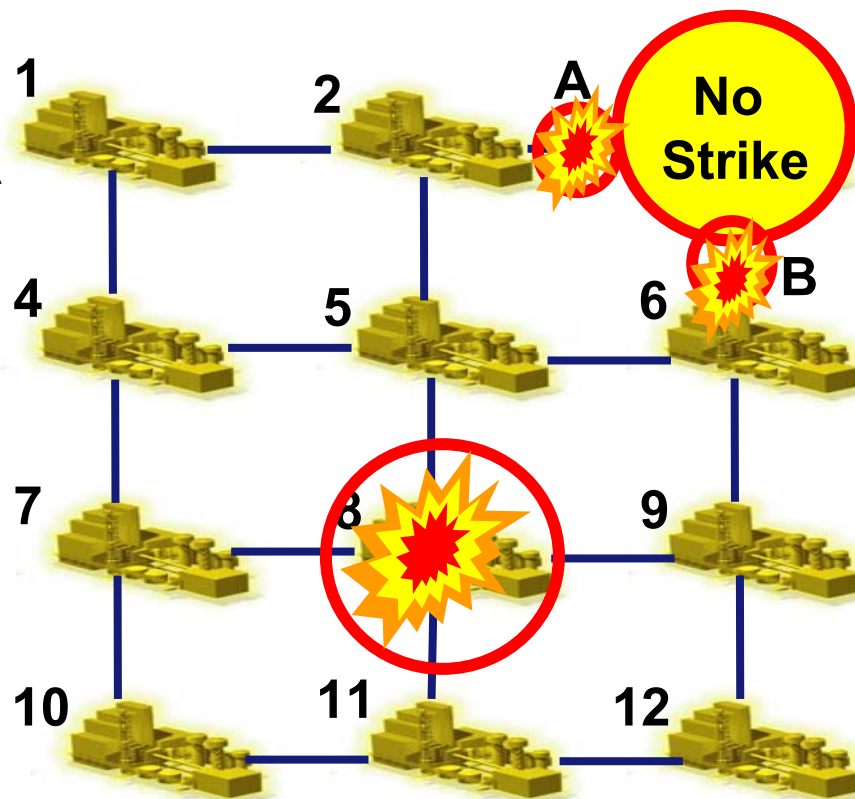


Essential Industries
(Electricity, POL, etc)

Priority

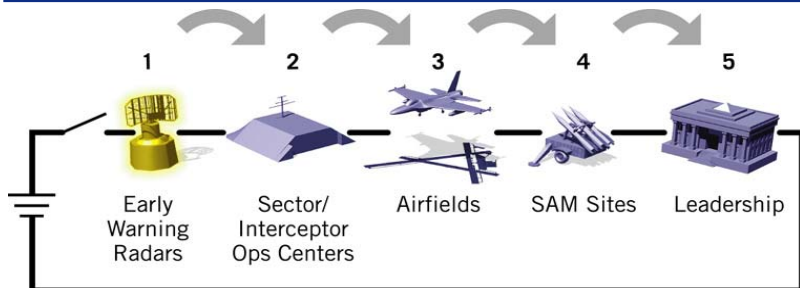
Target

1. Plant 8
2. Pwr Line A
3. Pwr Line B
4. Plant 2
5. Plant 6
6. Plant 9
7. Plant 10
8. Plant 1
9. Plant 4
10. Plant 5
11. Plant 11
12. Plant 12
13. Plant 7
14. Plant 3 (No Strike)

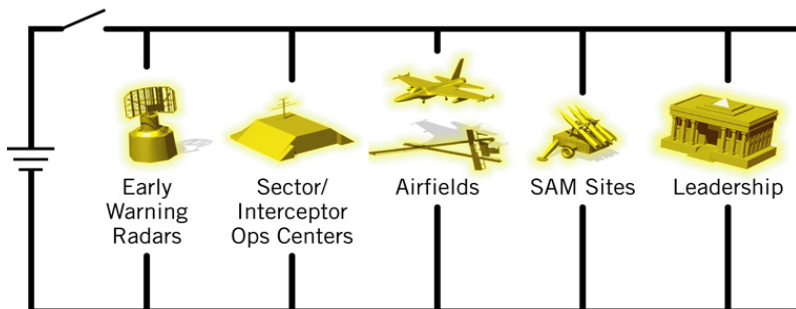




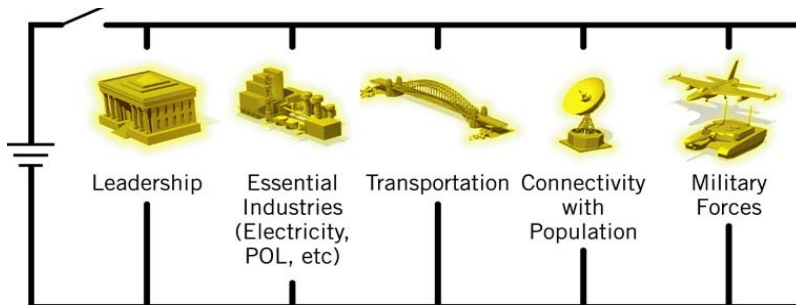
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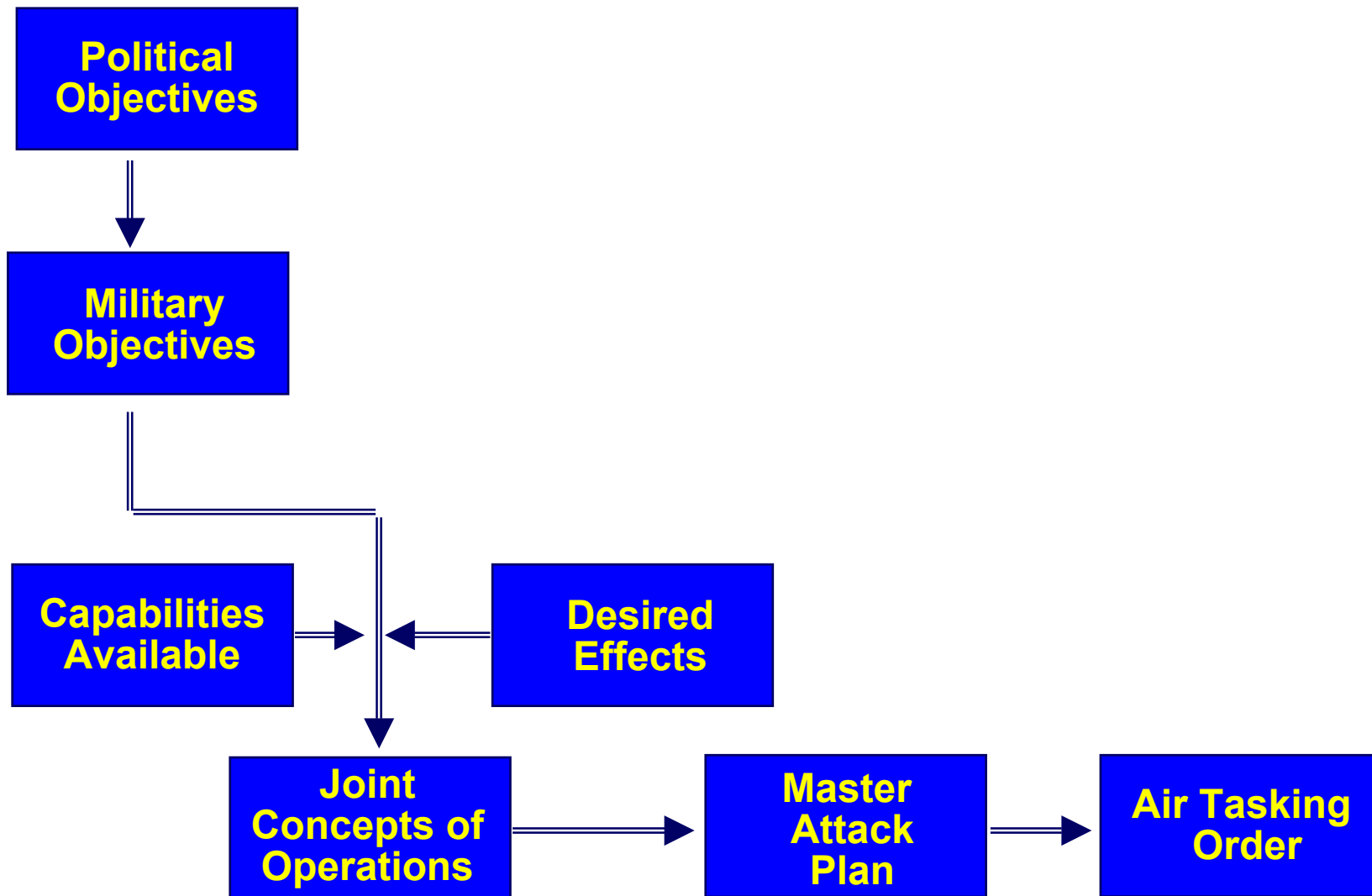
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**PARALLEL WARFARE -
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**PARALLEL WARFARE -
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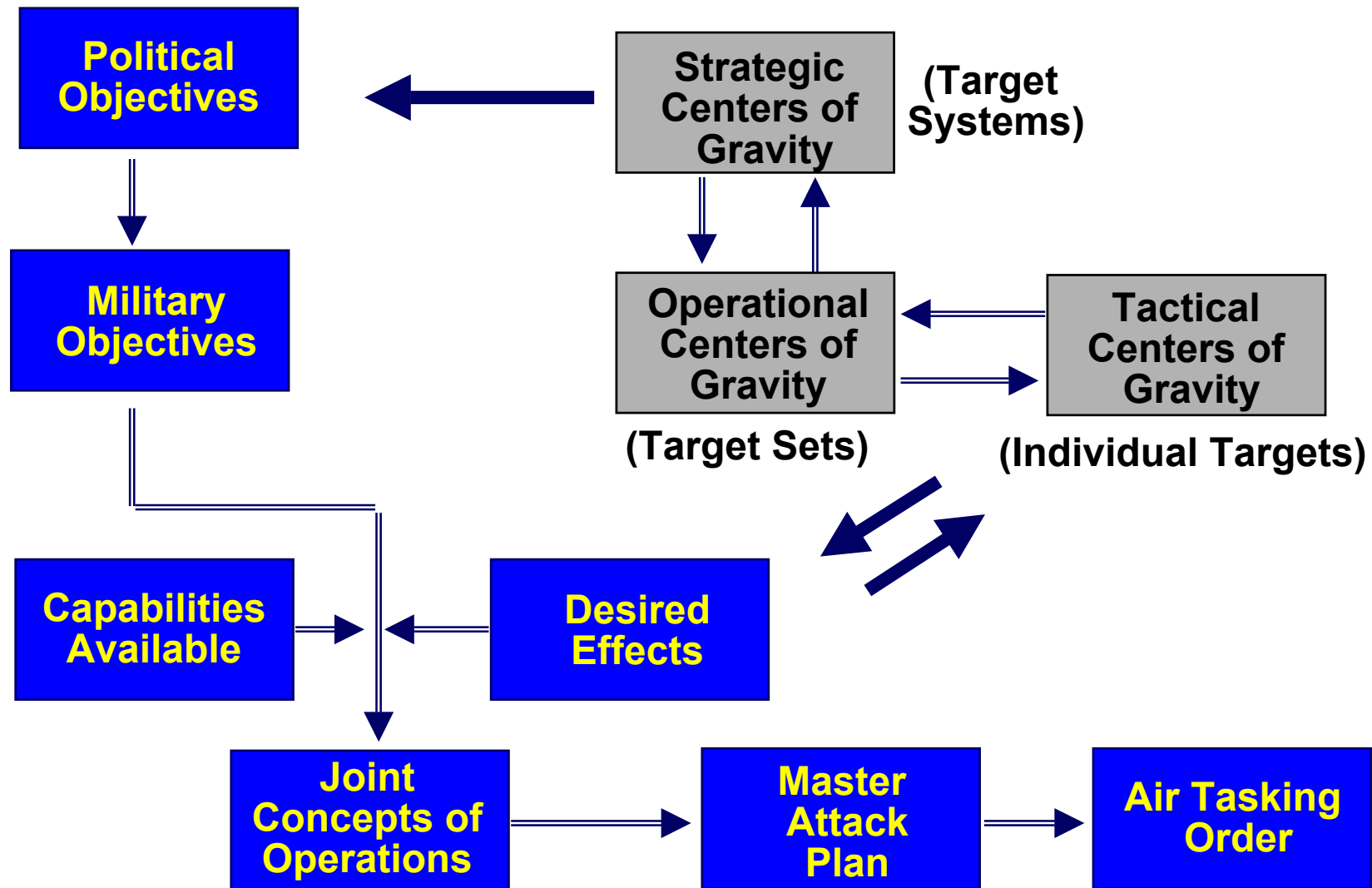


Key to Effects-Based Planning Success: Keep Execution Tasks Tied to Political Objectives



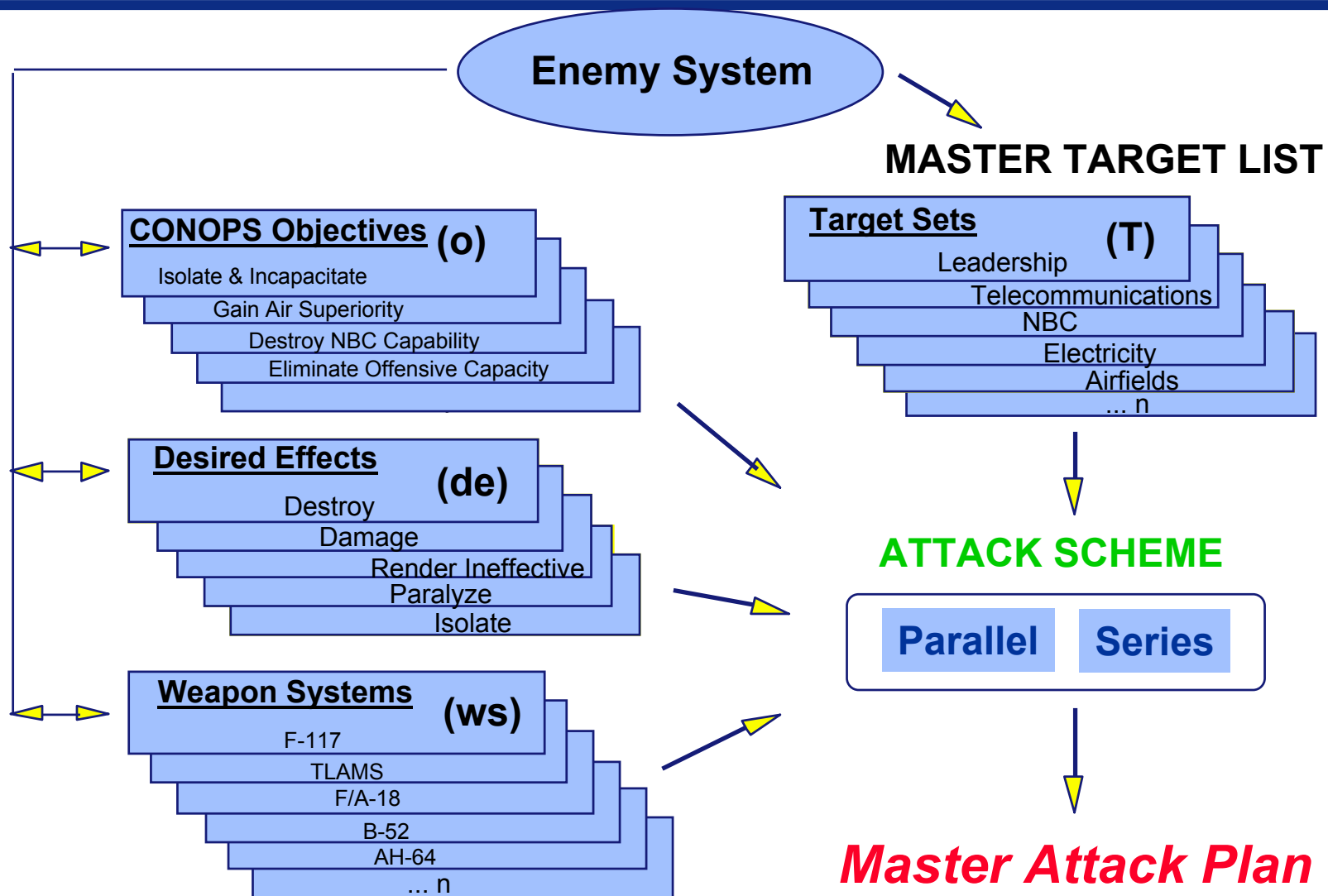


The Essence of Effects-Based Planning: A Systems of Systems Architecture





The What & How Of Master Attack Plan Design





Effects Based Operations

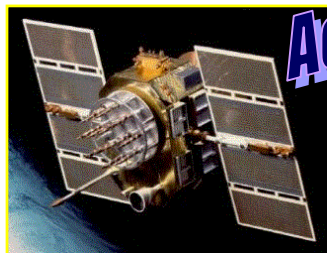
Concepts:

- *Rapid Aerospace Dominance*
- *Coercive Campaigns*
- *Cyber war and Perception Modification*
- *Rapid Halt*
- *Network Centric Warfare*
- *Shock & Awe*
- *Dominant Maneuver*

Capabilities:

- *Global Coverage*
- *Freedom of Access*
- *Persistent Over-watch*
- *Rapid Reaction*
- *CONUS Reachback*
- *Fewer Forces In Harms Way*

New Concepts & Capabilities



Aerospace Forces



Ground Forces



Maritime Forces



Headquarters Air Combat Command

Understanding and Mitigating Collateral Damage



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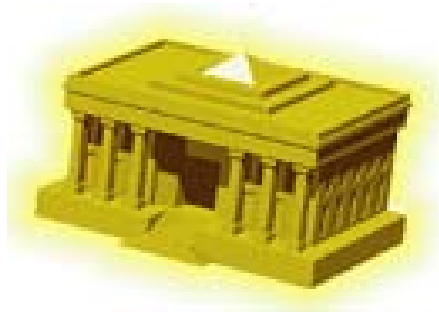
Collateral Damage

- **Collateral Damage:** The damage expected to occur to non-military or approved targets in the course of prosecution of valid, approved military targets
 - **Destruction of windows in a civilian structure located next to a military structure (e.g. barracks, Headquarters Bldg)**
 - **Unintended Damage:** Damage that occurs as a consequence of weapons or weapons system malfunction, unforeseen second order effects, or as a consequence of other “targeting” errors
 - **Fin failure on a guided munition**
 - **Hidden ammo bunker underneath a structure**
 - **Intelligence error**
 - **Collateral damage can be planned for and mitigated. The potential for unintended damage can be mitigated...but neither fully planned for or anticipated**
-

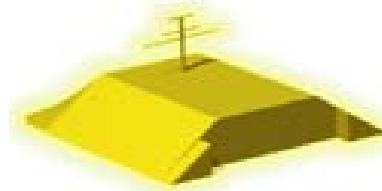


Collateral vs Unintended Damage

**Civilian Structure
Office Complex**



**Military Target
Bunker**



**Risk
Assessment**





Mitigating Collateral Damage: The Role of Military Planning

- **The principal way for military forces to mitigate the potential for collateral damage is develop clear military objectives and tied military actions directly to those objectives**
- **Numerous Steps in the Process**
 - **Objectives and Guidance**
 - **Target Development**
 - **Weaponneering**
 - **Force Application**
 - **Execution Planning and Force Execution**
 - **Combat Assessment**



Myths About Collateral Damage

- **Collateral Damage can be avoided in conflict**
- **Intelligence is perfect**
- **Weapons always work**
- **All damage is caused by friendly forces**
- **High altitude operations decrease weapons accuracy and increase the potential for collateral damage**
- **Collateral damage can be equally mitigated in air and ground operations**



The Good News

- **We know Iraq**
 - **Improved planning and assessment tools**
 - **FAST CD, Imagery Data Bases, Electronic Target Folders**
 - **Improved munitions**
 - **Joint Direct Attack Munition**
 - **Sensor Fuzed Weapon**
 - **Improved Tomahawk**
 - **Wind Corrected Munitions Dispenser**
 - **Improved aircrew training**
 - **Improved Weapons Assessment and Tracking**
 - **Post Conflict Preparations**
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